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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,268	01/26/2004	Kenichi Kitano	21581-00160-US3	6456
30678	7590	12/20/2005	EXAMINER	
CONNOLLY BOVE LODGE & HUTZ LLP			WU, IVES J	
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DATE MAILED: 12/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/763,268	Applicant(s) KITANO ET AL.	
	Examiner Ives Wu	Art Unit 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-30 and 51-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 38-49 is/are allowed.
- 6) ☒ Claim(s) 12-30 and 51-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5/25/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

- (1). **Claims 1-11 and 31-37, 50 are cancelled.**

Information Disclosure Statement

- (2). It is noticed that the 2nd sheet of Information Disclosure Statement filed on May 25, is not received in the docket.

Claim Rejections - 35 USC § 112

- (3). **Claims 22-30 and 56** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 22 and 56, it recites the functional group R⁹ in the formula (6) to be hydrogen, an alkyl group having 1-10 carbon atoms, an aryl group having 6 to 10 carbon atoms, or an aralkyl group having 7 to 10 carbon atoms. The structure of -C(R⁹)- is incomprehensive because the carbon atom herein would have two bonds instead of single R⁹ connected. Examiner cannot know the inventive scope of this structure in formula (6) in order to examine the patentability.

Claims 23 to 30 are rejected because of their dependence on claim 22.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(4). **Claims 12-30, 52-56** are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kusakabe et al (US005986014).

The applied reference has a common inventors: Masato Kusakabe, Kenichi Kitano with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this

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application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

(5). Kusakabe et al (US005986014A) disclose an acrylic polymers having functional groups at the chain ends such as an alkenyl group- or a curable silyl group-containing substituent by replacing the halogen atom in the formula (1):



where R¹ : hydrogen or methyl; R² : a C₁₋₂₀ alkyl, C₆₋₂₀ aryl or C₇₋₂₀ araalkyl; X: chlorine, bromine or iodine by polymerizing (meth)acrylate monomers using an organohalogenated compound as an initiator and a metal complex catalyst (Col. 2, line 40-46).

Method of preparing the alkenyl group comprising the steps (i) preparing a (meth)acrylic polymer having a chain end structure of the formula (1). (ii). Converting the halogen atom in the structure of formula (1) into an alkenyl group containing substituent (Col. 2, line 36-48) as represented by formula (2) to (5).

A (meth)acrylic polymer having alkenyl groups at the chain ends prepared according to the above-mentioned methods can be used as a main component of a curable composition. Such curable composition comprises: (A) a (meth)acrylic polymer having alkenyl groups at the chain ends prepared according to one of the methods described and (B) a polyvalent hydrogensilicon compound (Col. 11, line 41-47).

Methods of preparing the curable silyl groups at the chain ends comprising steps: (i) preparing a (meth)acrylic polymer having a chain end structure of formula (1) by

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polymerizing (meth) acrylate monomers using an organohalogenated compound as an initiator and a metal complex catalyst. (ii). Converting the halogen atom in the structure of formula (1) into a curable silyl group-containing substituent (Col. 3, line 6-17) as presented in formula (6) to (18). A (meth)acrylic polymer having curable silyl groups at the chain ends prepared according to the above-mentioned methods can be used as a main component of a curable composition (Col. 18, line 66 – Col. 19, line 40).

(Meth)acrylate monomers which are suitable for use in the practice are, in general, known compounds and include, but not limited to, the following: methyl (meth)acrylate, n-butyl (meth) acrylate. Other vinyl monomers such as styrene and acrylonitrile can be copolymerized if necessary (Col 4, line 54 – Col. 5, line 4). The polymerizations for the preparation of the (meth)acrylic polymer proceed in a living fashion to give polymers with a narrow molecular weight distribution ($M_w/M_n = 1.1 \sim 1.5$) (Col. 3, line 62-65). Also shown in Example 1, the molecular weight and the molecular weight distribution of the polymer were found to be 6700 and 1.6, respectively, by GPC analysis (Col. 20, line 41-43). The molecular weight of the polymer is preferably, but is not limited to, from 500 to 50,000 (Col. 19, line 4-5).

(6). As to the formula (5) in **the independent claim 13**, the formula (1) of Kusakabe et al would be equivalent to formula (5) of instant claim 13 by the following settings: Formula (1) of Kusakabe et al becomes $-\text{CH}_2 - \text{CH}(\text{COOR}^1) - \text{X}$ where R^1 is hydrogen, X is replaced by an alkenyl group containing substituent such as organotin compound $\text{CH}_2=\text{CH}-\text{CH}_2\text{Sn}(\text{CH}_3)_3$ (Formula 3, Col. 6, line 34-54) so that the final product is:

$$-\text{CH}_2 - \text{CH}(\text{COOR}) - \text{CH}_2 - \text{CH}=\text{CH}_2 \quad (\text{D})$$

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Formula (5) of instant claim 13 is exemplified as: $-\text{CH}_2 - \text{CH}_2 - \text{CH}(\text{COOR}) - \text{CH}_2 - \text{CH}=\text{CH}_2$ where R^8 : methylene group, R^7 : COOR, R^6 : Hydrogen. However, there is an additional $-\text{CH}_2-$ group in the formula (5) of instant claim 13 as compared to the formula (D) of Kusakabe et al, which is also repeating group of $-\text{CH}_2-$. Hence, the only structural difference between the formula (D) of Kusakabe with the hereinbefore setting and formula (5) of instant claim 13 with the hereinbefore setting is this methylene repeating group which renders *Prima facie* obviousness based on homolog relationship between prior art of Kusakabe et al formula (D) and formula (5) of instant claim 13. *In re Payne*, 606 F.2d 303, 203 USPQ 245 (CCPA 1979).

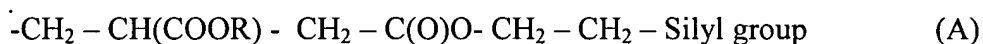
(7). As to the formula (6) in **the independent claims 22 and 56**, Kusakabe et al disclose the patentee's formula (1) and formula (7) which would be equivalent to formula (6) of instant claim 22 after the replacement of halogen atom in the formula (1) and (7) with the following settings (Col.2,line 38-43; Col.17,line 1-13):

Formula (1) of Kusakabe et al : $-\text{CH}_2 - \text{CH}(\text{COOR})\text{X}$, where R^1 : H.

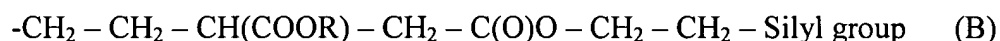
Formula (7) of Kusakabe et al: $\text{XCH}_2 - \text{C}(\text{O})\text{O}-\text{CH}_2 - \text{CH}_2 - \text{Silyl group}$,

where $\text{R}^1, \text{R}^{11}, \text{R}^{12}$: Hydrogen; R^{13} : $-\text{C}(\text{O})\text{O}-$; R^{14} : single bond.

The results of reaction for formula (1) and formula (7):



Now, the formula (6) of applicant's claim 22 is exemplified as following:

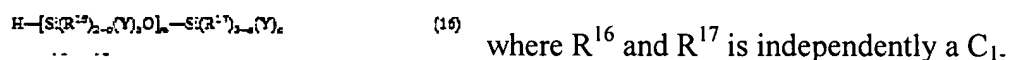


where $\text{R}^1, \text{R}^2, \text{R}^6, \text{R}^9$: Hydrogen; R^8 : $-\text{CH}_2 - \text{C}(\text{O})\text{O}-$ (alkenylester group: divalent organic group); R^7 : $-\text{COOR}$.

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The difference of formula (A) of Kusakabe et al and formula (B) of applicant renders the homolog obviousness as discussed in the paragraph (6).

As to the general formula (9) in the **independent claims 55 and 56**, Kusakabe et al disclose the patentee's curable silyl group-containing hydrogensilicon compound of formula (16):



(8). **Claims 51** is rejected under 35 U.S.C. 102(e) as being anticipated by Kusakabe et al (US005986014).

As to the formula (1) in the **independent claim 51**, Kusakabe et al disclose the patentee's formula (2) (Col. 5, line 65) to react with patentee's formula (1) generating the alkenyl group-containing vinyl polymer. The formula (2) of Kusakabe et al is disclosed in the formula of $\text{CH}_2 = \text{C}(\text{R}^3) - \text{R}^4 - \text{CH}_2 - \text{CH}_2 - \text{O} - \text{CH} = \text{CH}_2$ where R^6 : hydrogen; R^5 : $-\text{CH}_2 - \text{CH}_2 - \text{O} -$ (Col. 5, line 59 – Col. 6, line 2). The partial structure “ $-\text{CH}_2 - \text{CH}_2 -$

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O – CH = CH₂ “ of patentee’s formula (2) is equivalent to applicant’s formula (1) of instant claim 51 when the R¹, R²: hydrogen and R³: single bond.

Allowable Subject Matter

(9). Claims 38 - 49 are allowed.

Reasons for Allowance

(10). The metal ion or a quaternary ammonium ion-containing formula (10) of instant claim 38 for the preparation of vinyl polymer having alkenyl group at a terminus of its main chain and formula (11) of instant claim 44 for the preparation of vinyl polymer having a crosslinkable silyl group at a terminus of its main chain overcome the disclosure of closest prior art of Kusakabe et al (US005986014A) because the organo-metallic compounds such as organosodium compound in the formula (3) of Kusakabe et al does not carry the electron-withdrawing groups and the organo-metallic compound of Kusakabe et al is not ionic-bonded.

Conclusion

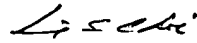
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ives Wu whose telephone number is 571-272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner: Ives Wu
Art Unit: 1713
Date: December 7, 2005


LING-SUI CHOI
PRIMARY EXAMINER